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Stakes and Motivation in Tournaments: Playing When There is Nothing to Play for but Pride

Lionel Page
Westminster Business School,
University of Westminster
& Judge Business School,
University of Cambridge, England

and

Katie Page
Department of Psychology,
Heythrop College,
University of London, England

Abstract: Tournaments are an effective means of incentivising participants to ensure an optimal level of effort. However, situations can occur in tournaments where the final outcome of a given competitor does not depend on his/her future performance. Specifically, we study these specific situations in a data set of the group stages of European football club competitions from 1992 to 2009. We identify situations where teams are already sure to finish either first or last at the penultimate stage in the group. We show that such situations affect team performance in the last match, typically decreasing the performance of a team sure to finish first and increasing the performance of a team sure to finish last. The first finding is in line with the economic predictions yet provides interesting implications, namely that the schedule of the match order plays a significant role in the overall performance of the team. The second, counter-intuitive, finding is not well accommodated into the existing economics framework and thus we discuss two alternative explanations, one based on social pressure and the other on pride.

I. INTRODUCTION

Tournaments, situations in which an individual's payment is dependent on his/her output or rank relative to others (Ehrenberg and Bognanno 1990), are very important as incentive schemes. Specifically, they provide a way to address the principal-agent problem by creating an incentive structure with which the principal can ensure that the agent produces the best first effort (Lazear and Rosen 1981, Green and Stokey 1983). Since the article by Lazear and Rosen (1981), tournaments have played a major role in the economic literature as an incentive scheme to allocate both positions and rewards. Consequently, numerous empirical studies have assessed how the structure of rewards created by a tournament influences behaviour,

as predicted by the theory. Prendergast (1999) presents a thorough review of the empirical literature on the role of incentives in the context of organisations and concludes that there is strong evidence that agents do respond to incentives, but that there still exists considerable scope for a range of empirical investigation.

Numerous studies have looked at sports competitions because they present tournament situations with very well defined and transparent reward structures. Ehrenberg and Bognanno (1990) found, for example, that professional golfers have lower scores when the prize money for which they compete increases. Similarly, Becker and Huselid (1992) show that higher prizes are associated with faster driving by professional NASCAR drivers. These studies demonstrate that tournaments in professional sports are effective incentive structures.

The empirical research in this area is not, however, confined to the sporting domain. Research exists which shows that performance in competitions is related to the tournament incentives in the broiler chicken industry (Knoeber 1989, Knoeber and Thurman 1994). Analogous to the sporting research, higher prizes for farmers result in better performance, in the sense that the chickens are heavier. The predictions of tournament theory have also been indirectly validated by studies on competitions to become a CEO. This research shows that a larger number of competitors are linked to higher rewards (Brian, Main, O'Reilly III, and Wade 1993, Eriksson 1999, Conyon and Peck 1998).

Therefore, previous empirical research supports the predictions of economic theory regarding tournaments and incentive schemes. Typically this literature is concerned with situations in which the tournament provides incentives for increased performance but what about other, more atypical, situations? For example, an interesting situation arises when tournaments create incentives to have a worse than average performance. A study by Taylor and Trogdon (2002) found that with the introduction of some incentives to lose in the NBA (following a change in the lottery system determining the draft order), teams with more incentives to lose were more likely to do so.

This paper examines another type of situation where tournament rewards do not create an incentive to win. Specifically, it looks at situations which arise in tournaments where the final outcome for a given competitor (in our case team) is already determined and therefore does not depend on the next performance of the competitor. These situations arise in tournaments with several rounds of competitions, where it is often the case that the final outcome of some competitors (teams) is already determined prior to the last round. In such cases, the competitor (team) has nothing to play for but pride.

The present paper studies these specific situations looking at a dataset of the group stage of European club competitions from 1992 to 2009. We identify situations where teams are already sure to finish either first or last at the penultimate stage in the group. We show that such situations affect team performance, typically decreasing the performance of a team sure to finish first and increasing the performance of a team sure to finish last. We discuss the possible explanations for these two different results. In addition, we show that this phenomenon introduces a hidden asymmetry in the tournament structure such that the team who plays the best team of the group last is advantaged. Therefore, the random draw of the order of matches is of vital interest, a fact which is usually neglected by commentators. The remainder of the paper is as follows: Section 2 provides an overview of the tournament structure, Section 3 presents the data, Section 4 outlines the results, and Section 5 discusses the results and concludes.

II. CHAMPIONS LEAGUE AND EUROPA LEAGUE COMPETITION CHARACTERISTICS

The UEFA Champions League is an annual Association Football cup competition which was created in 1955 by the French newspaper l'Equipe. Prior to 1992 the tournament was officially called the European Champion Clubs' Cup but was usually referred to as the European Cup or European Champions' Cup. The UEFA Cup, now known at the Europa League (and hereafter referred to as such), was established in 1971 after it superseded the Inter Cities Fairs Cup. Initially the Champions League was for the first teams in their respective European leagues and the Europa League was for the runners up and/or the cup winners. Since their creation both of these competitions have expanded to include more teams. The Europa League now has more than 70 teams[1] and the Champions League has more than 30 teams involved.[2]

Based initially strictly on knock-out encounters, they have progressively added group stages to the competitions. This is where teams are allocated to groups and play a round-robin style competition where the best team(s) progress to the following round of the competition. In a previous paper we studied the knock-out stages of these two European competitions and showed that the order of the matches in two legged ties matters, specifically advantaging the teams playing at home in the second match (Page and Page 2007).

In the present paper we look exclusively at the group stage. Group stages appeared for the first time in 1992 in the Champions League and were introduced in the 2004/05 season for the Europa League competition. The competitions have progressively developed and enlarged with the pressure of big European clubs to increase the number of European matches. In the group phase the Champions League now consists of 32 teams (8 groups of 4 teams) and the Europa League consists of 48 teams (12 groups of 4 teams)[3]. The ability to qualify for the knock-out stage is associated with huge financial rewards for the teams. As a consequence there is a strong incentive to perform well in the group stage where typically one or two teams per group will qualify (rules differ across competitions and across time).

Teams are allocated to groups via a seeding system. The seeding system using the UEFA coefficients in order to allocate teams. These coefficients are generated by the results of clubs representing each association during the previous five Champions League and Europa League seasons. The higher an association's coefficient, the more teams which represent the association in the Champions League and the fewer qualification rounds that the association's teams must compete in. The UEFA coefficients is based on the performance of teams in the European Cups spanning a five year period. During that period each team is awarded two points for a win and one point for a draw. The UEFA team coefficients are calculated as the sum of the number of points of each individual team, plus 20% of the country coefficient. From 2004-2008 the contribution of the country coefficient was 33%, and before 2004 the contribution of the country coefficient was 50%[4].

1 This is changing for the 2009/10 season.
2 The amount of teams varies across rounds and years.
3 In the Europa League prior to 2009/10 the group phase contains 40 teams with 8 groups of 5 teams.
4 Source: http://www.xs4all.nl/ kassiesa/bert/uefa/calc.html#details.

III. DATA

Our dataset consists of 3824 matches from the Champions League and the Europa League from 1992 to 2009. Overall, there are matches from 126 groups of the Champions League group stage, and 40 groups from the Europa League group stages (see *Table 1*). In the Champions League, the groups are composed of 4 teams and each team plays all the other teams home and away (6 matches in total). In the Europa League, the groups are composed of 5 teams and each team plays the other teams once, either home or away (4 matches in total).

To describe the order of the matches in the group stage, we use the term round. The first match played by a team in the group stage is the first round match, and so forth. In addition to the outcome of the match, we collected the UEFA coefficients[5] for all the teams to measure the estimated quality of the team in each group. UEFA uses these coefficients to allocate the teams in the groups with a seeding system (see Section 2 for more details).

Table 1: Breakdown of matches by year and competition

Year	CL	UEFA	Total
1992*	48	0	48
1993	48	0	48
1994	48	0	48
1995	96	0	96
1996	96	0	96
1997	96	0	96
1998	144	0	144
1999	144	0	144
2000	288	0	288
2001	288	0	288
2002	288	0	288
2003	288	0	288
2004	192	0	192
2005	192	160	352
2006	192	160	352
2007	192	160	352
2008	192	160	352
2009	192	160	352
Total	3024	800	3824

* 1992 refers to the 1991/92 season and similarly for the other years.

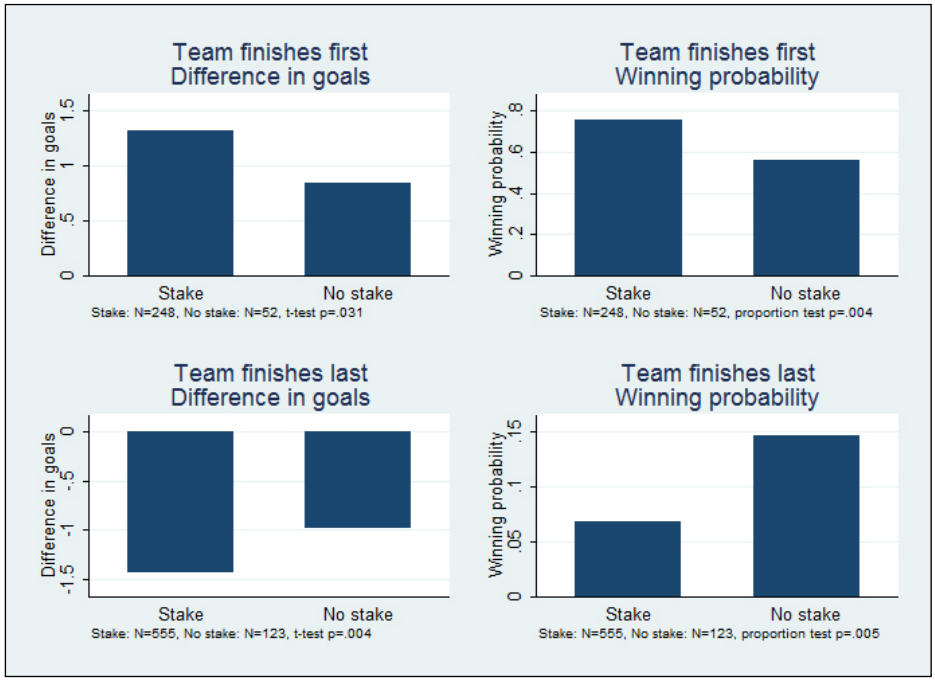
IV. RESULTS

First, we investigated whether there was a significant difference in terms of both the probability to win the match and the goal difference for teams finishing both first or last in situations where there are stakes as opposed to situations where there are no stakes. We selected all the matches of the team whose final position as first or last of the group was already ensured after the penultimate game. This subsample contains 300 matches of teams finishing first

5 From the website http://www.xs4all.nl/ kassiesa/bert/uefa/

and 678 matches of teams finishing last. These data can be seen in Figure 1. For all analyses we pooled across competitions.

Figure 1: Team outcomes in stakes versus no stake conditions
(teams finishing first are shown in the top row, teams finishing last in the bottom row)



These graphs clearly show that when a team that is guaranteed to finish first before the end of the tournament, they score less goals in the final match when there are no stakes (N = 52) compared to the previous matches where there were stakes (N = 243), and their overall probability to win is less in the final match than in the preceding matches when there was stakes (N = 243) versus no stakes (N = 52).

In contrast, for the team that is guaranteed to finish in last position prior to the final match they are likely to score more goals in the final match when there no stakes (N = 123) as opposed to previous matches when there were some stakes (N = 555). They are also more likely to win their final match than their preceding matches when there are no stakes (N = 123) than stakes (N = 555). These differences are all significant at the 0.05 level.

In order to assess the magnitude of these effects we performed several regressions predicting both the difference in goals and the probability to win whether there are stakes or no stakes, including team-group-year-competition fixed effects (see columns 1 and 3 of *Table 2*). These fixed effect regressions show that there seems to be a significant effect of stake on both the goal difference and the probability to win[6]. When there are no stakes, teams that finish first

[6] The difference between the sample size for the OLS and the Logit is a results of 6 teams being dropped because the best team always wins.

score on average 0.46 goals less than they were scoring in matches where there were stakes. Similarly, the probability to win for the first teams significantly decreases in matches with no stakes.

One potential explanation for these results could be that there is regression to the mean because the "no stake" situations could follow exceptional very good performances. For instance, teams who end up being qualified after the penultimate game may have had the chance to be opposed to the easiest teams in the group first, or they may have played more home games than away games. However, when we control for home/away effects and differences in teams' ability (using the UEFA coefficients) the effect on both goal difference and winning probability increases rather than decreases (columns 2 and 4 of *Table 2*). The effect if now 0.52 goals less for situation of no stakes (for first teams only) and an even greater likelihood to lose in no stakes situations. The magnitude of these effects seems quite large with more than half a goal difference. As would be expected both the home advantage effect and the UEFA coefficients are significant in the model, meaning that teams that play at home and those of greater ability are more likely to win and have a greater goal difference.

Table 3 shows the same fixed effect regressions for teams which finish last in the group. Interestingly, the results show the exact opposite pattern than for teams who finish first. Initially there is a 0.498 difference in goals for no stake conditions meaning that teams who have nothing to play for in their last match score on average 0.498 goals more than in their previous games. They are also significantly more likely to win matches where there are no stakes (column 3 of *Table 3*). Again, after controlling for potential regression to the mean by adding the home/away effect and the differences in team ability, the effect becomes even stronger. The difference in goals increases to 0.545, an effect similar in magnitude for that of the first teams. The coefficient in the logit regression for the probability to win also increases from 0.894 to 0.964. The fact that these coefficients increase, or remain roughly the same, implies that this phenomenon is unlikely to be driven by regression to the mean.

These results indicate that there should be an advantage to playing a top team (defined as the team with the highest UEFA coefficient) last in the group. This is because a top team is most likely to have no stakes in the final match (from 166 groups, this is the case in 52 of them, almost a third). Because the schedule of the matches is random the round when a given team will face the top team of the group is random. Does this therefore provide an advantage to meet the favourite (top) team at the end of the group stage?

Figure 2 seems to indicate that this is indeed the case. We defined the "favourite" as the team with the highest UEFA coefficient in the group and plot the average goal difference of all the other team against this top team as a function of the round in the group when they are opposed to this favourite. Figure 2 shows that a team has a better goal difference (i.e. -.4 in round 6 as opposed to -.6 in round 1) when they meet the best team in a later round. This is the case in both the competitions with 5 teams per group and 4 teams per group but it is more pronounced when there are only 4 teams per group (in the Champions League where there are 6 matches in total per team in the group). The numbers for the goal difference are all negative because a given team is more likely to lose when playing the favourite team at any round in the competition.

Table 2: Effect of lack of stakes on the match result when the team is ensured qualification

	Fixed effect OLS		Fixed effect Logit	
	(1) Δ Goals	(2) Δ Goals	(3) Win	(4) Win
No stake	-0.463*	-0.518*	-0.867**	-1.101**
	(0.221)	(0.207)	(0.308)	(0.347)
Δ UEFA coef.		0.007*		0.011
		(0.004)		(0.006)
Home		0.899***		1.373***
		(0.156)		(0.293)
Constant	1.314***	0.651***		
	(0.092)	(0.158)		
Year-competition-group-team FE	🕑	🕑	🕑	🕑
N groups	52	52	46	46
N matches	300	300	268	268

Signficant at: *$p < 0.05$; **$p < 0.01$; ***$p < 0.001$
Standard errors are shown in parentheses.

Table 3: Effect of lack of stakes on the match result when the team is guaranteed not to qualify

	Fixed effect OLS		Fixed effect Logit	
	(1) Δ Goals	(2) Δ Goals	(3) Win	(4) Win
No stake	-0.498**	-0.545***	-0.894**	0.964**
	(0.159)	(0.147)	(0.300)	(0.331)
Δ UEFA coef.		0.009***		0.013*
		(0.002)		(0.006)
Home		1.031***		
		(0.113)		1.247***
				(0.328)
Constant	1.434***	-1.793***		
	(0.068)	(0.094)		
Year-competition-group-team FE	🕑	🕑	🕑	🕑
N groups	123	123	19	49
N matches	678	678	288	288

Signficant at: *$p < 0.05$; **$p < 0.01$; ***$p < 0.001$
Standard errors are shown in parentheses.

Figure 2: Goal difference versus the favourite team as a function of the round of the match

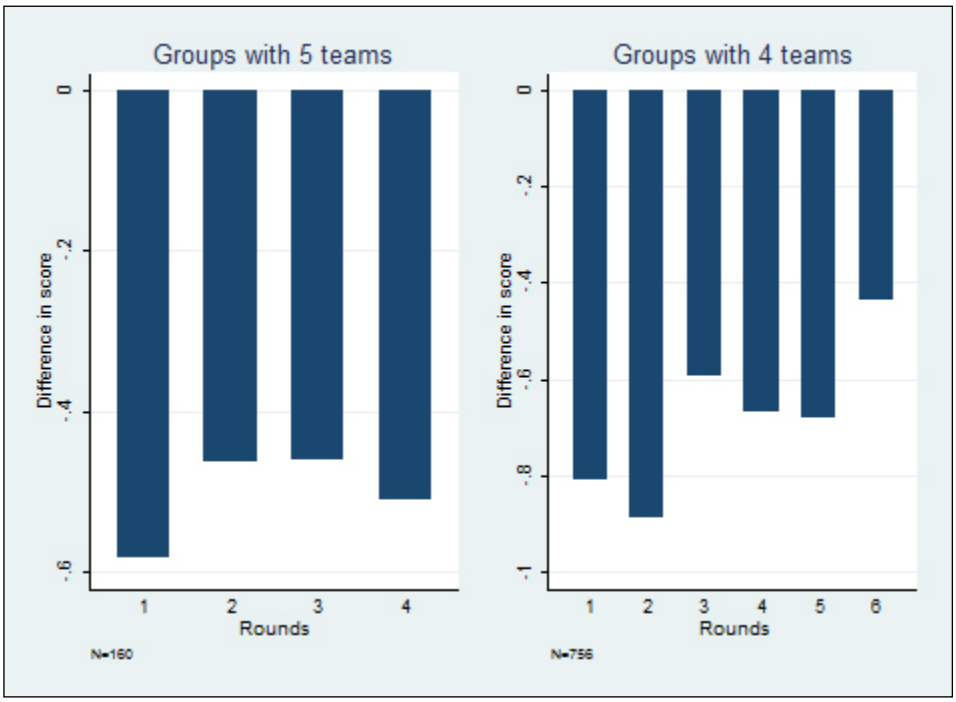


Table 4: Effect of the schedule: match results against the top team as a function of the round of the match

	Fixed effect OLS		Fixed effect Logit	
	(1) Δ Goals	(2) Δ Goals	(3) Win	(4) Win
Last round	0.304*		0.314	
	(0.142)		(0.202)	
Round		0.391*		0.648**
		(0.157)		(0.233)
Δ UEFA coef.	0.010***	0.010***	0.011***	0.011***
	(0.002)	(0.002)	(0.003)	(0.003)
Home	1.041***	1.048***	1.111***	1.139***
	(0.110)	(0.110)	(0.169)	(0.170)
Constant	-0.826***	-0.967***	-1.452***	-1.732***
	(0.112)	(0.135)	(0.173)	(0.211)
N matches	916	916	916	916

Signficant at: *$p < 0.05$; **$p < 0.01$; ***$p < 0.001$
Standard errors are shown in parentheses.

A regression analysis using the last round variable confirms this finding. When meeting the favourite team, the final score will be 0.304 more goals in favour of the underdog if the underdog plays the favourite in the last round of the group stage (column 1 of *Table 4*). In another regression we used the variable round, normalised between 0 and 1, and it is positive in both the OLS regression and in the Logit regression, indicating that an underdog team is more likely to both win (*round* = 0.648; $p < 0.01$) and have a better goal difference (*round* = 0.392; $p < 0.05$) against the favourite team if it meets this team later in the group stage.

V. DISCUSSION AND CONCLUSION

Overall, we find that when there are no stakes in a competition it significantly affects performance. Specifically, when you are in a guaranteed leading position you perform less well than in previous rounds. On the contrary, when you are in a guaranteed losing position your performance increases. The first result in line with previous findings which highlight the importance of incentives on performance in tournament settings (Ehrenberg and Bognanno 1990, Becker and Huselid 1992).

In our case we identify situations where teams do not have an interest to win (at least relative to the strict rewards from the competition). Unlike the NBA situation of Taylor and Trogdon (2002), the results of our paper apply in numerous situations. Typically a no stakes situation (either for the first or last team) occurs in 139 groups of the 166 groups we observed, which is 84% of the situations. Therefore, these occurrences are frequent and likely to have important consequences on the nature of this tournament, and tournaments similar in structure.

Our results are also interesting for two reasons. First, in the case of the first team, we found that the lack of stakes decreases performance, perhaps as a result of decreased motivation, and as a consequence the team performance declines. This decrease in performance may be due to either a lack in motivation from the players or from the coach who may not field his best players, or some combination of these two elements. Therefore, the team who is lucky enough, just through the chance of the draw, to face the favourite (top) team in such situations is advantaged. This is an undesirable feature of the competition because it introduces an unfair advantage for this team for no justifiable reason. A more general consequence of these results is that it is possible to predict that the team who is due to face the best team later in the group stage is more likely to win against it. If known about this could promote strategic planning in terms of levels of optimal levels of motivation and effort.

Second, we find that the lowest ranked team who plays a match without stake is more likely to win than when there is a stake. This counter intuitive result warrants further investigation. We conjecture two possible reasons for such a phenomenon. First, teams finishing last are usually weaker than the other contenders in the group. When playing without stakes, the level of pressure is likely to be at its lowest which may have a direct positive effect on their performance. This explanation ties in with work in the social psychological literate about the role of expertise and performance under pressure. Specifically, performances will deteriorate significantly more for competitors of lower ability when they are under social pressure.

A second explanation is that teams who are already sure to finish last will only play for pride. While pride, a high sense of self worth, may not be that important for the first teams who

have already proven that they were the best team, it may be much more important for teams who have nothing else to get from the competition in their last match pride is their incentive. Again, this explanation has support in the social psychological literature which suggests that pride is an important motivator in overall performance and perseverance (Berkowitz and Levy 1956, Williams and Desteno 2008). The better performance of the lowest ranked teams playing for pride may just reveal the fact that pride matters in competitions, beyond the strict financial rewards linked to the tournament.

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